

WHAT IS CLAIMED IS:

1. A liquid sprayer comprising:

a liquid holder exposing a liquid surface of conductive liquid sprayed on an
5 object; and

a field applier forming an equipotential surface convexed with respect to the
liquid surface of a conductive liquid sprayed on an object.

2. The liquid sprayer according to claim 1, comprising:

a conductive nozzle plate, supplied with a potential different from that for said
10 object, having:

a first opening exposing said liquid surface, and

a second opening wider than said first opening and arranged closer to said
object than said first opening.

3. The liquid sprayer according to claim 2, further comprising:

a concave portion provided between said first opening and said second opening
and concaved with respect to said object.

4. The liquid sprayer according to claim 3, wherein

the angle in said first opening of said nozzle plate is in excess of 270° .

5. The liquid sprayer according to claim 2, wherein

said first and second openings are provided in plural respectively.

6. The liquid sprayer according to claim 5, further comprising:
a vibration exitor provided in correspondence to each of said first openings and
vibrating said liquid for spraying said liquid.

5 7. The liquid sprayer according to claim 2, further comprising:
a step provided between said first opening and said second opening.

8. The liquid sprayer according to claim 7, wherein
said first and second openings are provided in plural respectively.

9. The liquid sprayer according to claim 8, wherein
the shapes of said first and second openings are not similar to each other.

10 10. The liquid sprayer according to claim 1, comprising:
15 a conductive nozzle plate having a first opening exposing said liquid surface,
and
a conductive auxiliary plate arranged closer to said object than said nozzle plate
for exposing said first opening to said object.

20 11. The liquid sprayer according to claim 10, wherein
said nozzle plate and said auxiliary plate are supplied with the same potential.

12. A liquid sprayer comprising:
a nozzle plate having an opening exposing a liquid surface of a liquid sprayed
25 on an object; and

a discharger, supplying charges to said liquid at least on said liquid surface and a surface of said nozzle plate closer to said liquid surface, relatively movable with respect to said nozzle plate.

5 13. The liquid sprayer according to claim 12, wherein
said discharger is a corona discharger.

10 14. The liquid sprayer according to claim 12, forming an equipotential
surface convexed with respect to said liquid surface.

15 15. The liquid sprayer according to claim 14, wherein
said nozzle plate has:
a first opening exposing said liquid surface, and
a second opening wider than said first opening and arranged closer to said
object than said first opening, and
said discharger supplies said charges to said nozzle plate from the side of said
second opening.

20 16. The liquid sprayer according to claim 15, further comprising:
a concave portion provided between said first opening and said second opening
and concaved with respect to said object.

25 17. The liquid sprayer according to claim 1, wherein
said liquid is supplied with ultrasonic vibration and sprayed from said liquid
surface.

18. The liquid sprayer according to claim 17, further comprising:
drive means generating said ultrasonic vibration, and
a reflecting wall reflecting said ultrasonic vibration propagating through said
5 liquid and converging said ultrasonic vibration on said liquid surface.

19. The liquid sprayer according to claim 12, wherein
said liquid is supplied with ultrasonic vibration and sprayed from said liquid
surface.

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20. The liquid sprayer according to claim 19, further comprising:
drive means generating said ultrasonic vibration, and
a reflecting wall reflecting said ultrasonic vibration propagating through said
liquid and converging said ultrasonic vibration on said liquid surface.